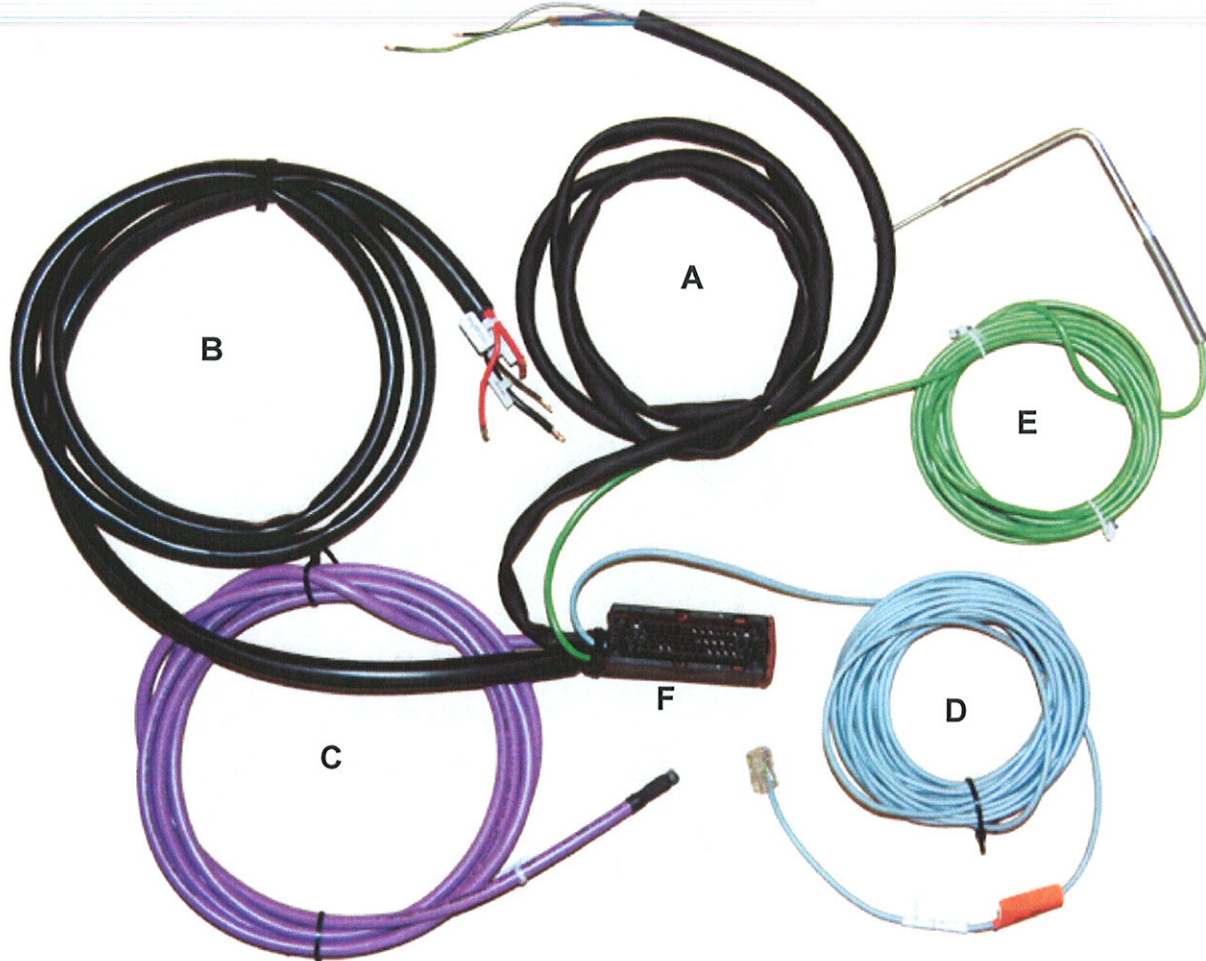


## Cable Harness (Overview)

**IMPORTANT: DISCONNECT BATTERY BEFORE INSTALLATION!**



**Figure 1:** Cable-harness with plug connector for the ControlBox (F), cable-harness branches for power supply (B), input/output lines (A), and CAN lines (C) as well as bus cable (D) and temperature sensor (E).

### **A Inputs and outputs (I/O)**

Violet

input for revs data (frequency)

Blue/Yellow

at terminal W or vacant input

Black/White

input (vacant input)

Black/Green

alarm output 1

alarm output 2



### **B Power supply**

Red (2x)

continuous power (battery, 30)

Black/red

ignition (15)

Black

ground



### **C CAN I/O**

White

CAN High

Brown

CAN Low



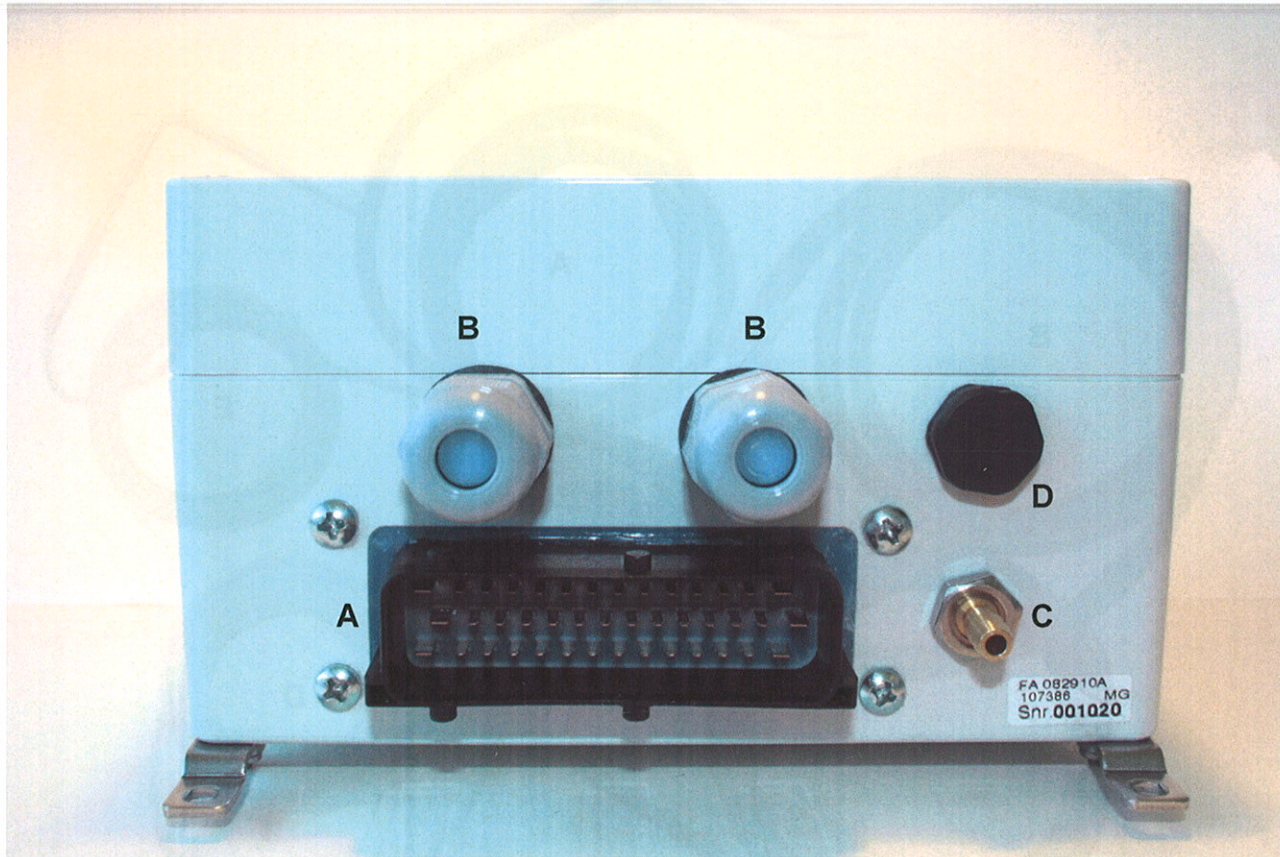
### **D Bus cable to the Panel Box**



### **E Temperature probe with connecting cable**



## ControlBox



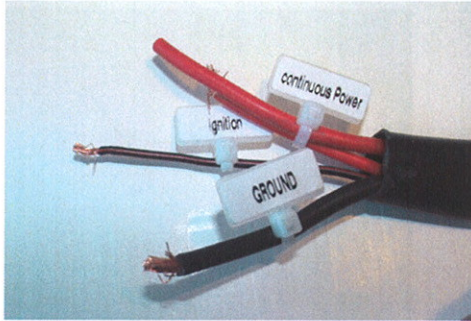
**Figure 2:** ControlBox.

- A** Connector for the cable harness plug
- B** Optional outlets for GPS- and GMS antennae
- C** Backpressure sensor
- D** Counterbalance valve



### Step 1: Connecting up Power Supply Cables

To provide power supply, the black ground cable is connected to the battery negative terminal, the black/red ignition cable to ignition, and the red continuous power cables by the use of the two fuse kits to the battery positive terminal.



Power supply cables



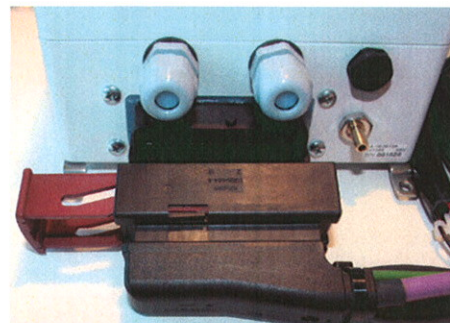
Fuse kits

### Step 2: Connecting up Main Components (ControlBox, PanelBox)

Connect the cable-harness plug to the interface on the ControlBox and the bus cable plug to the PanelBox.



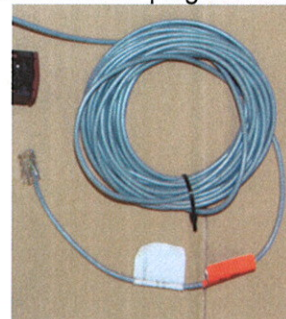
ControlBox



Cable harness plug and ControlBox



PanelBox



Bus cable with plug

### Step 3: Installation of optional Components (CAN I/O, RPM Sensor)

RPM: Glue the permanent magnet to the crankshaft.

**Warning: Superglue → Handle with care!!!**



CAN J1939 cable



RPM sensor

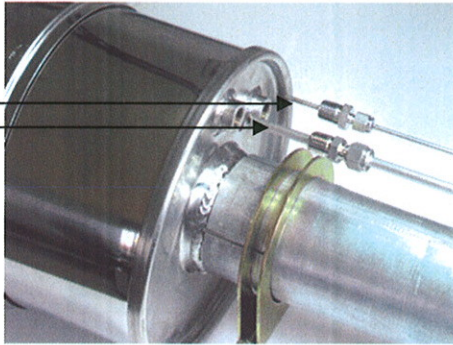


Superglue

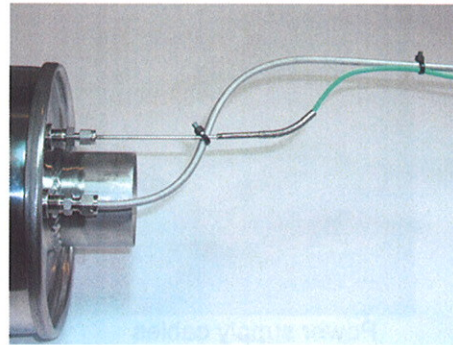


## Step 4: Sensor Installation (Pressure Sensor, Temperature Sensor)

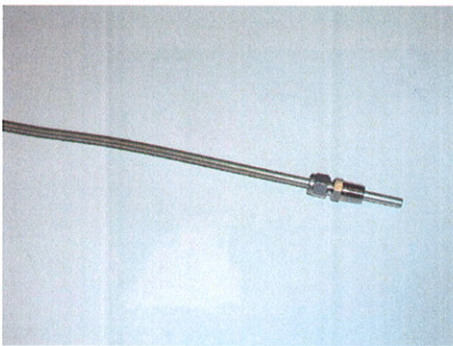
Pressure-port connection  
Temperature probe



Insertion of probes into the DPF inlet module



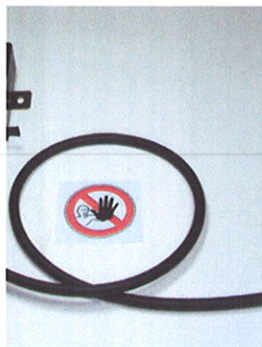
Probe cable held with ties to prevent swinging



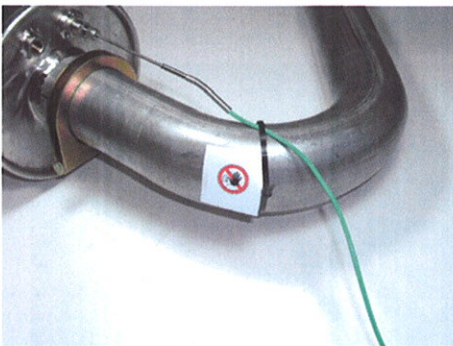
Pressure pipe **RISING**



Coils **MUST NOT** face downwards!



**NO** Looping of the pressure hose!



**NO** cables or hoses to be attached to components which heat up!



# DYNTEST SYSTEM

## [Showcase]

# Quick Installation Guide

## (Version 1.0)

Downloads and updates:  
<http://www.cpk-automotive.com>

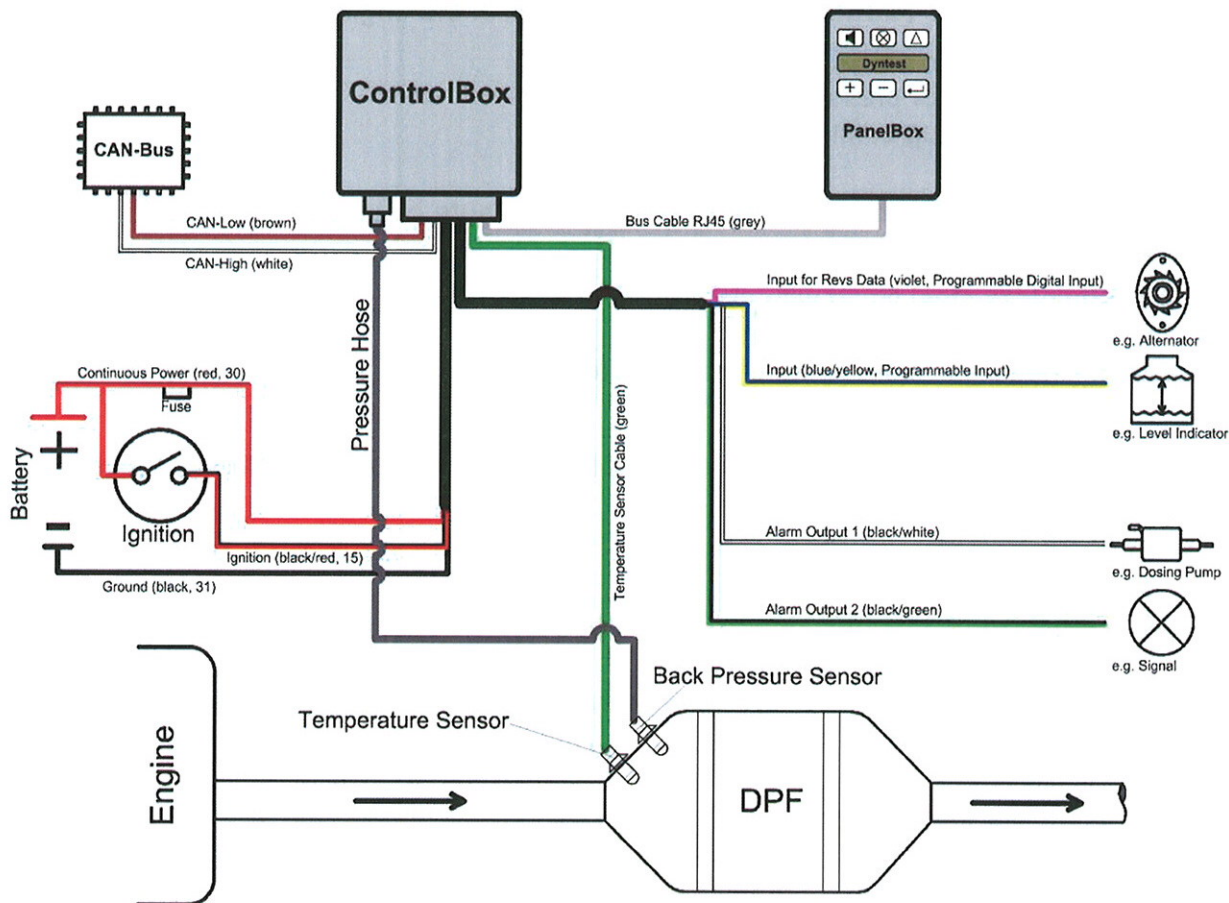
## Table of Contents

1	The DYNTEST System .....	1
2	Scope of Installation.....	2
3	Installation Instructions for Sensors .....	4
4	Connecting up the Cable Harness .....	6
5	PanelBox Functions and Keys .....	7
6	Basic Settings .....	8
7	Entering SETUP Menu .....	8
8	Activating Add-on Devices .....	9
9	Controlling and Adjusting Add-on Devices .....	9
10	Downloading and Analysing Data .....	11
11	Maintenance of DYNTEST Components .....	11
12	Alarm Codes .....	12



## 1 The DYNTEST System

# DYNTEST SYSTEM



**Figure 1:** Diagrammatic overview of the DYNTEST system. The arrangement of the metering and control components, and how they interact with the rest of the exhaust-gas system, is also shown. The main components are marked grey. The power-supply connections are indicated as follows: continuous power (red), ground (black), ignition (red/black), bus cable for the transmission of data between the ControlBox and the PanelBox/PC (grey). The cables provided for in-/ and outputs are colored as follows: input for revs data (frequency) or vacant input (violet), input (vacant input; blue/yellow), alarm output 1 (black/white), alarm output 2 (black/green), CAN high (white), and CAN low (brown). The backpressure sensor and the temperature sensor are shown as well. The hoses/cables for these components are labeled as follows: pressure hose (dark grey), temperature-sensor cable (green).

**If you would like more detailed information about the DYNTEST system, visit our homepage ([www.cpk-automotive.com](http://www.cpk-automotive.com)) and feel free to get in touch!**

## 2 Scope of Installation

The DYNTEST system components, which are shown on page 5, are as follows:

1. **CONTROL UNIT (ControlBox)** –to be installed in the engine compartment–
  - a) Connection to cable harness
  - b) Connection for pressure hose and pipes
  - c) Integrated plug connector for GSM module
2. **PRESSURE CONNECTION SET** –provides pressure connection between the filter and the Control Box–
  - a) Stainless-steel fitting with clamp-ring connector
  - b) Stainless-steel pipe, 54 cm
  - c) HT hose (resistant to high temperatures)
3. **FUSE KIT** –integrated in the power-supply (permanent positive polarity); provides protection against overvoltage –
  - a) Fuse
  - b) Fuse holder
  - c) Cable clamps (crimp connectors)
4. **CABLE HARNESS** –for the power supply, and for the connection between the Control Box and the Panel Box–
  - a) Power supply (10-30 VDC)
  - b) Input line and output line (I/O)
  - c) Temperature probe, with 5-metre connecting cable
  - d) 10-metre bus cable for the connection between the ControlBox and the Panel Box; this cable is also used to transmit data that are to be analysed at a PC.
5. **RPM SENSOR** –for rotary speed measurement–
  - a) Hall effect sensor
  - b) Permanent magnet
6. **DISPLAY (On-Road PanelBox)**
  - a) Switchable illuminated display in which temperature, pressure and engine-speed (rpm) readings are shown; menu items are also shown in this display when the system is in maintenance mode
  - b) 6 function keys (programming), 2 of them illuminate and have a signal function
  - c) Buzzer
  - d) Displays the measured values

Optional extras:

- 5- or 10-metre extension bus cable (with plug)
- Moisture separator (recommended accessory)
- Temperature sensor with 10-metre cable

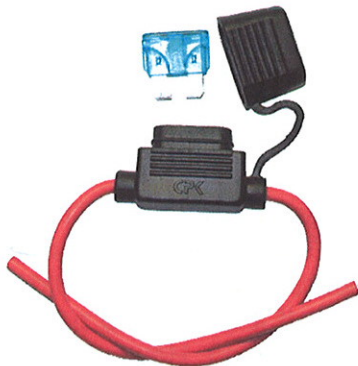




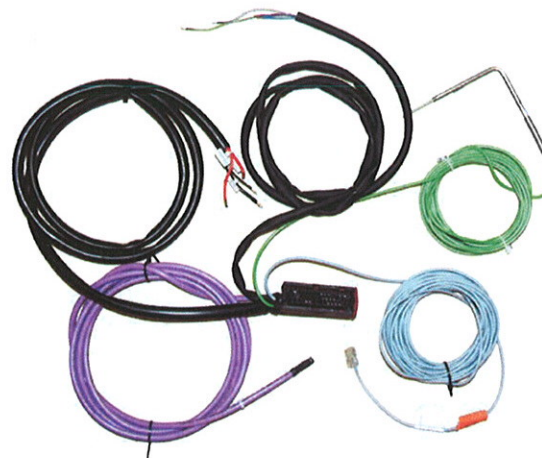
**Figure 2:** Control unit (ControlBox) with connectors for the cable harness, pressure hose, shock absorbers, and integrated plug connector for GSM.



**Figure 3:** Pressure Connection Set with installation instructions and mounting accessories



**Figure 4:** Fuse kit containing fuse, fuse holder, and cable tie.



**Figure 5:** Cable-harness with plug connector for the ControlBox, cable-harness branches for power supply, input/output lines, and CAN lines as well as bus cable and temperature sensor.



**Figure 6:** PanelBox (On-Road) with Display, six function keys, and acoustical/optical signal function.



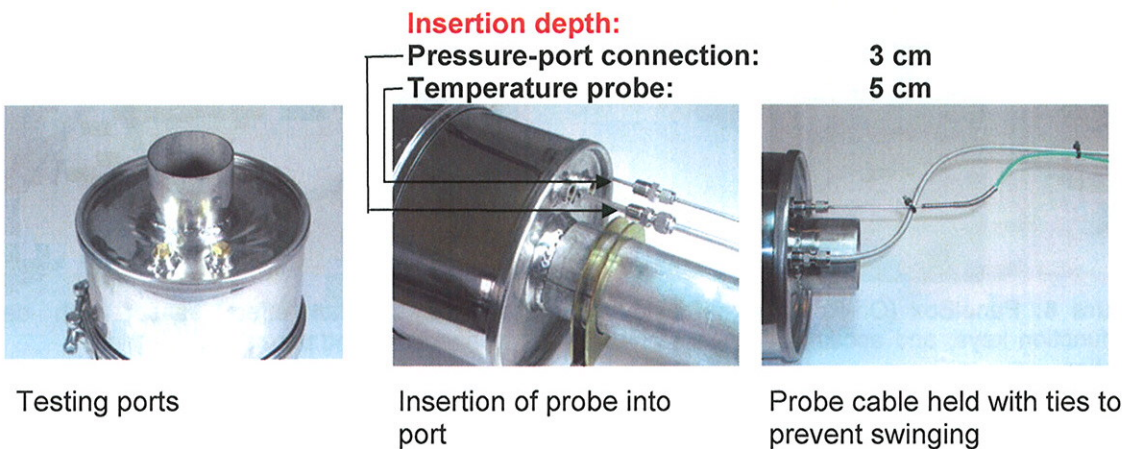
**Figure 7:** Hall effect sensor with cable connections and permanent magnet.

### 3 Installation Instructions for Sensors

1. Secure the ControlBox in a position protected against excessive heat or water (like i.e. in the engine compartment) and at least 50 cm above the filter system. **All connectors should face downwards.** For fastening the ControlBox to the body of the vehicle it is advisable to use shock absorbing material.
2. If possible install the stainless steel pressure tube upstream of the particulate filter. The ControlBox should be in a position higher than 50 cm above the test ports of the filter. The tube should be tightly secured by means of a clamp ring connector (1/4 NPT) after inserting it for approx. **3 cm** into the test port of the inlet of the filter housing. The tube should have a minimum length of 50 cm. In case it is longer it may be coiled – and not to be cut off - in order to adjust it to the optional length. Unless tube and hose are in a straight ascending line it is necessary to add a desiccant dryer or water separating unit to the back pressure hose outside of the ControlBox. Tube and hose are to be secured by fixing slings without any contact with hot metal. Ensure ample flex in the back pressure hose to allow for vibrations of the exhaust system. Make sure that the distance between test port and control box will not be less than 1.50 m.

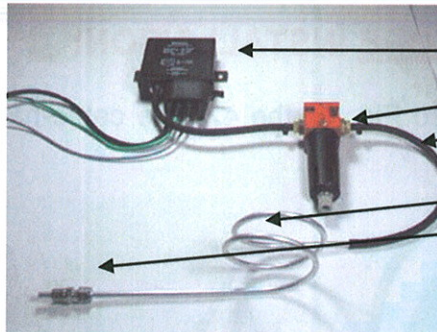
It is very important that no part of the hose is lower than the test port. The connections shall be routed continuously ascending without forming any traps or pockets.

3. Next, the temperature probe is inserted in the corresponding 1/4" NPT clamp-ring connector on the filter, and then secured in place. It should now reach about 5 cm into the filter-housing inlet. The tip of the temperature probe should now be positioned directly in the stream of the exhaust gas. If it is not, the probe can be pushed further than 5 cm inside the inlet on the filter housing. However, you should take care to ensure that the filter substrate is not damaged, and that the temperature-probe cable is kept clear of hot exhaust-system components!  
Do not overtighten the screw connection, as this could damage the probe. If necessary, the probe can be very gently bent, so that it is slightly curved. (On no account should it be bent sharply!) The probe cable should be secured to the ControlBox with cable ties in such a way that vibrations are damped. Care should be taken to avoid contact with components which heat up.

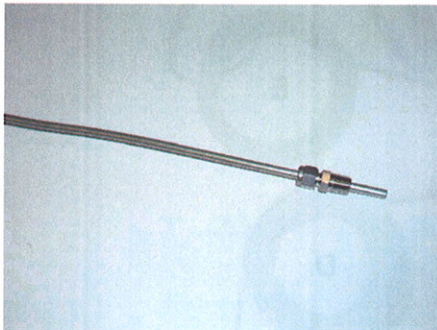




## Pressure Connection



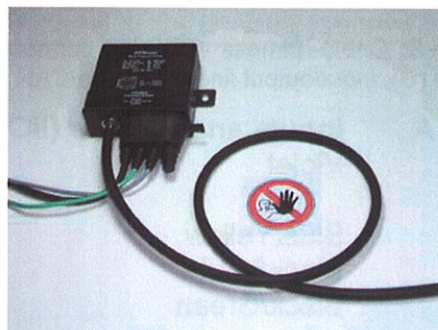
- ControlBox
- Moisture Separator
- Pressure Hose
- Pressure pipe (with coils facing upwards)
- Clamp-ring screw connector



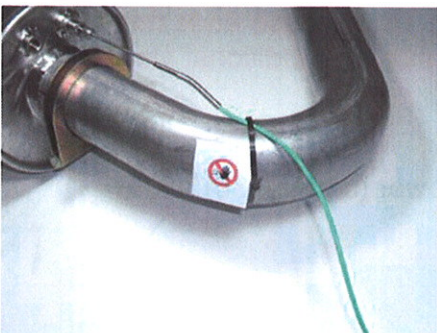
Pressure pipe **RISING**



Coils **MUST NOT** face downwards!



**NO** Looping!

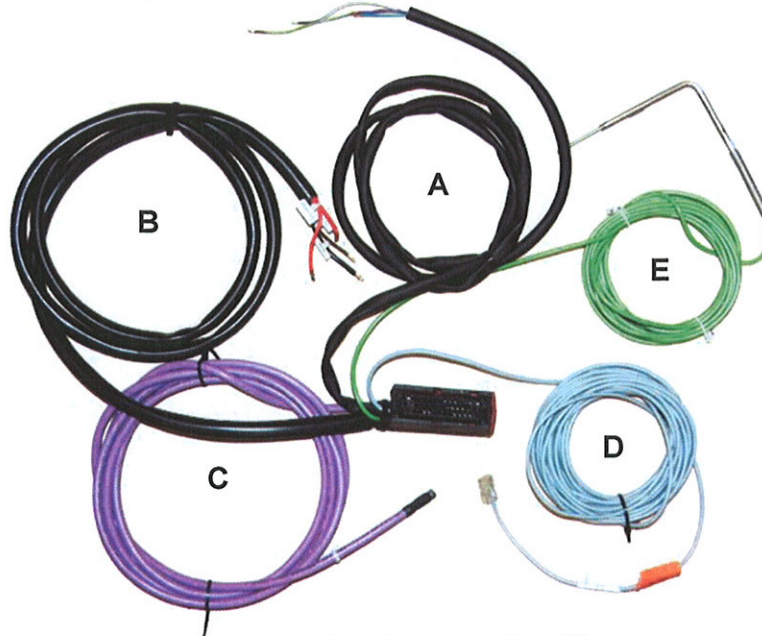


**NO** cables or hoses to be attached to components which heat up!

## 4 Connecting up the Cable Harness

### **IMPORTANT: DISCONNECT BATTERY BEFORE INSTALLATION!**

After all the cables have been connected up (see also Fig. 1), the 42-pole cable-harness plug is connected to the interface on the ControlBox.



**Figure 8:** Cable-harness with plug connector for the ControlBox (F), cable-harness branches for power supply (B), input/output lines (A), and CAN lines (C) as well as bus cable (D) and temperature sensor (E).

#### **A Inputs and outputs (I/O)**

Violet

input for revs data (frequency)  
at terminal W or vacant input

Blue/Yellow

input (vacant input)

Black/White

alarm output 1

Black/Green

alarm output 2



**Important note:** The free ends of the alarm outputs have been bent round (to prevent short circuiting) and tucked inside the cable-harness jacket. These loose ends must be carefully drawn out and connected up in the prescribed manner before additional alarm functions or special programs are activated.

#### **B Power supply**

Red (2x)

continuous power (battery, 30)

Black/red

ignition (15)

Black

ground



#### **C CAN I/O**

White

CAN High

Brown

CAN Low



#### **D Bus cable to the Panel Box**

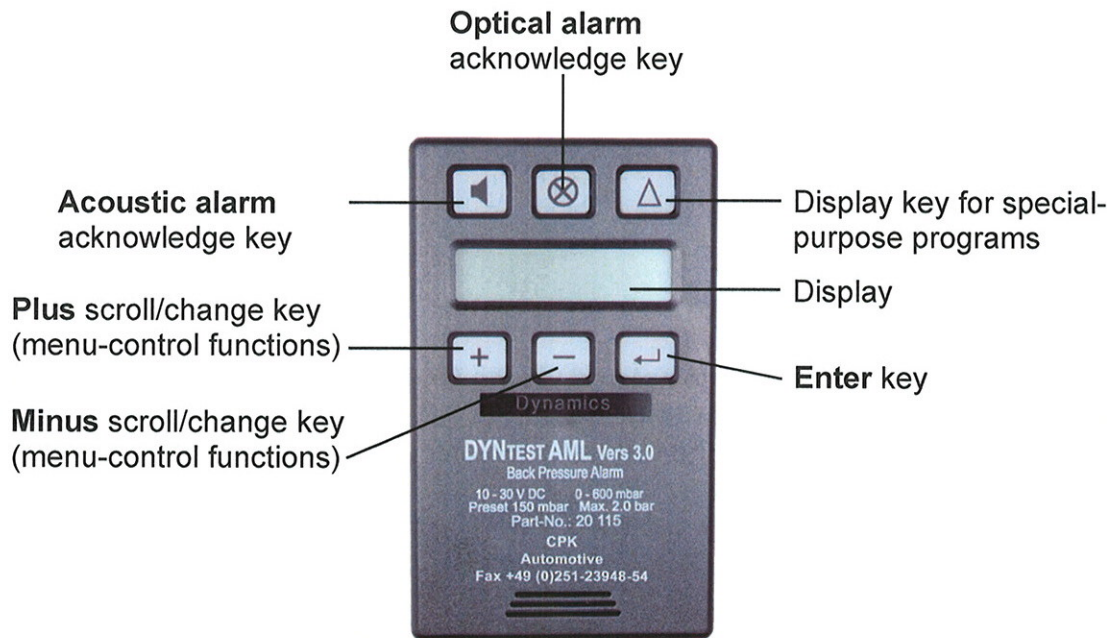


#### **E Temperature probe with connecting cable**



## 5 PanelBox Functions and Keys

All DYNTEST system settings are entered via the On-Road PanelBox (Fig. 9). The “↵” key (bottom row of keys) is only active when the system is in **Maintenance Mode** (see **Section 7**). The “↵” key is for initiating and confirming the entry of system commands. The “△” key is only available for a number of special-purpose programs (see the Installation and Operating Instructions for the DYNTEST System).



**Figure 9:** The function keys and the display on the On-Road PanelBox

The “+” and “-” keys are used to scroll through menu items and displays. The values for the individual menu items are set when the PanelBox is in maintenance mode, and these settings too are entered by pressing the “+” and “-” keys. All new settings must be confirmed by pressing the “↵” key.

The new settings confirmed by means of the “↵” key are displayed after a brief delay. All the PanelBox keys are backlit by an orange LED. The keys require < 1 second to process the various signals.

## 6 Basic Settings

The DYNTEST system is generally ready to be set to work directly. All operating values have been preset in the factory; in many cases these need not be changed, but new values may have to be specified for certain types of operation.

### Factory Settings

Lower pressure limit	15 mbar
Upper pressure limit	150 mbar
Engine speed (rpm)	OFF
GSM	OFF
PLC (NOx)	OFF
CAN I/O	OFF

## 7 Entering SETUP Menu

All DYNTEST system settings are entered via the On-Road PanelBox. Press the top row of 3 keys to switch over to the **Maintenance Mode**. After entering the maintenance mode, press the (+) and (-) buttons until the desired submenu can be accessed by confirming the item shown on the display with the “↵” key.

The **SETUP** menu is selected by pressing the “+” key or the “-” key (several times if necessary). Entry into the various **SETUP** submenus is confirmed by pressing the “↵” key.












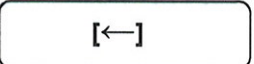


Step	Key	Display	Step	Key
1.			2.	

→ **SETUP Menu**



## 8 Activating Add-on Devices

For example, the GSM module can only be activated and used for further programming after the **GSM** function has been switched on in the **DEVICES** submenu. The **DEVICES** submenu is selected by pressing the “+” key or the “-” key in the **SETUP** menu (several times if necessary), and this selection is confirmed by means of the “↵” key. The **GSM:OFF** function in this submenu is selected by means of the “+” key or the “-” key, and then called up to the display by pressing the “↵” key. **E:GSM=OFF** is then changed into **E:GSM=ON** by pressing the “+” key or the “-” key. This change is confirmed by pressing the “↵” key, after which **GSM:ON** appears in the display. The back arrow [←] is selected by pressing “+” key or the “-” key, and this selection is confirmed by pressing the “↵” key. **DEVICES[ACTIVE]** now appears in the display, and this marks the completion of the activation process.

Step	Key	Display	Step	Key	Display
1.			2.		
3.			4.		
5.			6.		
7.					

**SETUP → DEVICES → GSM:ON (PLC:ON, CAN\_IO:ON)**

**NOTE:** The activation of the **GSM**, **PLC (NOx)**, or **CAN\_IO** functions always take place in the **DEVICES** submenu in an analogous manner as described above.

## 9 Controlling and Adjusting Add-on Devices

All of the operating parameters of add-on devices are defined in specific submenus of the **SETUP** menu. These are the submenus for the control of parameters and measured values as well as for the fine adjustment of the various individual functions on which the efficient operation of the add-on devices depends.

### 1. GSM/GPRS/GPS module RemCo®

Enter the **GSM\_INFO** submenu to control and adjust the GSM parameters. The **GSM\_INFO** submenu is selected by pressing the “+” key or the “-” key. Entry into the various submenus is confirmed by pressing the “↵” key.

**SETUP → GSM\_INFO**

## 2. CAN I/O module

Enter the **CAN\_IO\_ANALOG** submenu to control the CAN bus signals. The **CAN\_IO\_ANALOG** submenu is selected by pressing the “+” key or the “-” key. Entry into the various submenus is confirmed by pressing the “↵” key.

### SETUP → CAN\_IO\_ANALOG

The CAN signal channels were preset as follows:

**A\_IN1:** Diesel consumption (l/h)  
**A\_IN2:** Throttle (%)  
**A\_IN3:** Engine rpm (rpm)  
**A\_IN4:** EGR mass flow (kg/h)  
**A\_IN5:** Intake air mass flow (kg/h)  
**A\_IN6:** Engine load (%)

## 3. PLC (NOx) module

Enter the **PLC\_ANALOG** submenu to control two additional NOx sensor signals. The **PLC\_ANALOG** submenu is selected by pressing the “+” key or the “-” key. Entry into the various submenus is confirmed by pressing the “↵” key.

### SETUP → PLC\_ANALOG

The NOx signal channels were preset as follows:

**A\_IN7:** NOx1 (optional component)  
**A\_IN8:** NOx2 (optional component)

If you would like more detailed information about DYNTEST add-on devices, visit our homepage ([www.cpk-automotive.com](http://www.cpk-automotive.com)) and feel free to get in touch!



## 10 Downloading and Analysing Data

The data stored in the DYNTEST ControlBox can be read out and analysed on a computer. To do this, you will need the DYNTEST Analyser Set, which can be obtained from your supplier.

The downloaded data are stored in two files. One of these is freely accessible; the other file (in ZIP format) is password-protected, and contains the data obtained from the measured-values memory and the alarm memory. This file is provided for the benefit of your supplier.

### NOTE:

Showcase and SEP I-III: The data download can be performed by the CARB only.

## 11 Maintenance of DYNTEST Components

### Temperature Sensor

The temperature sensor should be taken out and cleaned with oil remover once a year, and at all events after every 100,000 km driven, or after every 3,000 hours of operation. After cleaning, the sensor can be re-installed in your vehicle's exhaust system. We recommend that the temperature sensor be inspected and cleaned whenever the filter is due for cleaning.

### Pressure connection set

The pressure hose and pipes must be thoroughly cleaned once a year, after all ERROR 32 fault reports, at the very latest after 100,000 km, or after every 3,000 hours of operation. To release the connection pipe for cleaning, slacken the clamp-ring connector connecting the pipe to the filter. Next, cut open the cable tie which holds the moisture separator in place, and pull out the pressure hose. Begin cleaning the pressure connection set by removing deposits of soot etc. from the pressure pipe. Next, rinse out the pressure hose with cleaning solvent (benzene), and afterwards blow-dry with compressed air. The pressure hose is then reattached to the system. Ensure that all the connections are pressure-sealed, and that a new cable tie is used to hold the moisture separator securely in place.

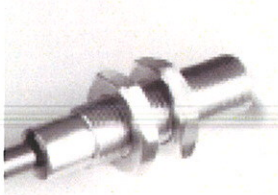
No further maintenance is required.

## 12 Alarm Codes

- Error 11 One of the keys on the Panel Box has jammed**  
Press the keys (if necessary, repeatedly) until the fault is corrected.
- Error 12 Display**  
Check the display for damages
- Error 21 No communication between the Control Box and the Panel Box**  
Check the plug connectors and the cable harness; switch off the ignition and then switch it on again
- Error 22 12C-Bus**  
Please contact your dealer
- Error 23 Software status in the Control Box not the same as in the Panel Box**  
Contact your authorized dealer.
- Error 31 Break in the pressure hose or pressure pipes, or damage to the filter**  
Check the pressure connection. If the pressure hose and pipes are undamaged, send the Control Box to an authorized dealer for inspection.
- Error 32 No pressure 10 minutes after the ignition has been switched on**  
Possible error sources: (1) Engine is not running → Switch on engine; (2) Faulty connection, or pressure pipe blocked → Reconnect and secure pressure pipe, or clean out pressure hose as per maintenance instructions.
- Error 33 Temperature unchanged 10 minutes after the ignition is switched on**  
Make sure engine is running and probe is still correctly attached to the filter.
- Error 34 Damaged temperature-sensor probe**  
Install replacement cable harness with new temperature probe.
- Error 35 Switch point for the lower pressure limit has been reached**  
**Serious error!** Additive supply is cut off. The filter can no longer function!
- Error 36 Switch point for the upper pressure limit has been reached**  
Raise the exhaust-gas temperature by increasing the engine load in an appropriate manner. Or start regeneration procedures (e. g. AR) The higher exhaust-gas temperature will enable the particle filter to burn more soot; the exhaust-gas back pressure will then sink to a normal level, and the illuminated displays will be extinguished. **Important note:** Do not allow the engine to overheat!
- Error 37 No signal from terminal W**  
If this error report is generated while the engine is running, check the connection between the Control Box and terminal W, and repair if necessary. **Serious error!** The alarm outputs will not function until the error is rectified.
- Error 38 Filter check produces unsatisfactory result**  
Switch off the report by confirming with the  $\sqcup$  key. Return the filter to the factory to have it checked. If necessary, replace.
- Error 39 Additive Tank Low**  
Refill additives for FBC (Fuel Borne Catalyst)
- Error 41 Measured Data cannot be recorded**  
Contact your authorized dealer.
- Error 42 Alarm Data cannot be recorded**  
Contact your authorized dealer.
- Error 51 The date could not be verified and logged**  
Repeat the procedure. If the problem persists, contact an authorized dealer.
- Error 52 Time could not be verified and logged**  
Repeat the procedure. If the problem persists, contact an authorized dealer.
- Error 61 PLC activated, no communication**  
Module connected?
- Error 62 GMS activated, no communication**  
Module connected?



## 55075 Geartooth Hall Effect Sensor Features and Benefits



### Features

- Rotary position geartooth sensor
- Stainless steel M12 threaded barrel
- Electronic protection against severe and automotive environments
- Self adjusting magnetic range
- 3 wire (voltage output)
- EMC protection (consult Hamlin)
- Short circuit/reverse voltage protection
- Zero speed detection

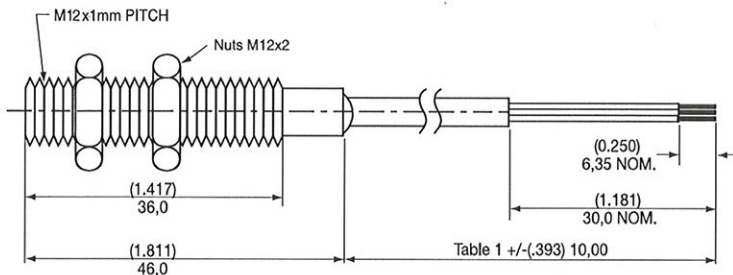
### Benefits

- Long life; up to 20 billion operations
- High speed operation
- No chopper delay
- Unaffected by harsh environments
- Rotary orientation not critical
- On-chip 10 bit A/D converter
- Customer selection of cable length and connector type

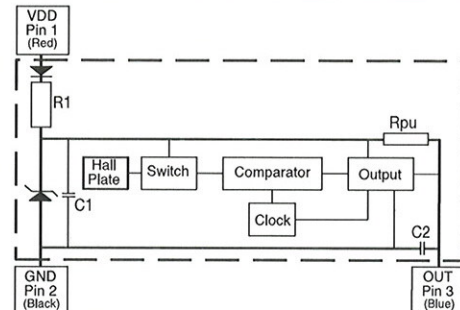
### Applications

- Geartooth sensor
- Camshaft sensor
- Linear encoder
- Rotary encoder

### DIMENSIONS (in) mm



### BLOCK DIAGRAM

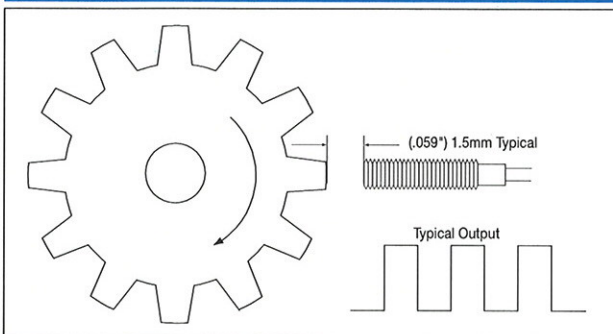


### SPECIFICATIONS

Hall Type			Digital Switch 3 Wire (Voltage Output)
Supply Voltage (Note 1)	Maximum	Vdc	-25 to +25.2
	Operation	Vdc	4.75 to 25.2
	Overvoltage Protection	Vdc-max	27
Output High Voltage	Vdc-min	VDD - 2 (sinking outputs with internal pull-up resistor)	
Output Low Voltage	Vdc-max	0.6 @ 20mA	
Output Current (continuously on)	mA-max	20	
Current Consumption	mA-min	1	
	mA-max	10.5	
	kHz-max	15	
Switching Speed	kHz-max	15	
Temperature	Operating	°C	-40 to +85
	Storage	°C	-65 to +85

Note 1 - As long as Tj (Junction Temperature) is not exceeded

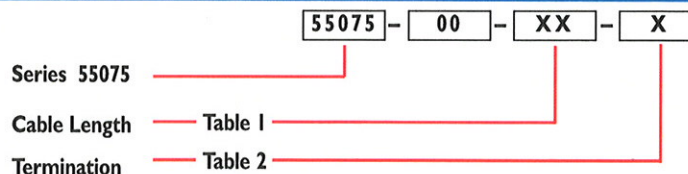
### APPLICATION EXAMPLE - Geartooth Sensor



### CUSTOMER OPTIONS - Cable Length and Termination

TABLE 1 Cable Length Options:- (Cable Type 24 AWG 7/32 PVC 105°C, Double Insulated)		TABLE 2 Termination Options:-	
SELECT OPTION	CABLE LENGTH (in) mm	SELECT OPTION	DESCRIPTION
01	(3.94) 100	A	Tinned leads
02	(11.81) 300	B	Crimped terminals
03	(19.69) 500	C	6.35mm fastons
04	(29.53) 750	D	AMP MTE 2.54mm pitch
05	(39.37) 1000	E	JST XHP 2.5mm pitch

### ORDERING INFORMATION



Hamlin USA Tel: +1 920 648 3000 • Fax: +1 920 648 3001 • Email: [sales.us@hamlin.com](mailto:sales.us@hamlin.com)  
 Hamlin UK Tel: +44 (0) 1379 649700 • Fax: +44 (0) 1379 649702 • Email: [sales.uk@hamlin.com](mailto:sales.uk@hamlin.com)  
 Hamlin Germany Tel: +49 (0) 6142 923920 • Fax: +49 (0) 6142 923921 • Email: [sales.de@hamlin.com](mailto:sales.de@hamlin.com)  
 Hametrol France Tel: +33(0) 1 6047 3000 • Fax: +33(0) 1 6015 9136 • Email: [sales.fr@hamlin.com](mailto:sales.fr@hamlin.com)

Issue No: AE Date: 16.10.08 DCR B5970

INFORMATION PROVIDED ON THIS DATA SHEET IS PROVIDED FOR INFORMATION PURPOSES ONLY AND SHOULD NOT BE RELIED UPON AS BEING ACCURATE FOR ANY PARTICULAR PURPOSE. Product performance may be affected by the application to which the product is put. Upon request, HAMLIN will assist purchasers by providing information specific to any particular application. HAMLIN disclaims any and all liability whatsoever for any purchaser's reliance upon the information contained on this data sheet without further consultation with authorised representatives of HAMLIN.